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PROCEEDINGS  
OF THE  
AMERICAN SOCIETY OF MICROSCOPISTS.

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MINUTES OF THE FOURTEENTH ANNUAL MEETING.

*Held at Washington, D. C., August 11th, 12th, 13th, and 14th, 1891.*

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TUESDAY, August 11th, 1891.

The members assembled in the lecture-room of the Medical Department of Columbian University, No. 1325 H street, and at a few minutes after 10 o'clock were called to order by the President, Dr. Frank L. James, of St. Louis, Missouri.

Prayer was offered by the Rev. R. S. L. Wood, who invoked the divine blessing on the Society and its work.

Dr. John S. Billings, surgeon U. S. A., was then introduced, and made the following address of welcome.

*Mr. President and Gentlemen:* It is my pleasant duty this morning to bid you welcome to Washington, and to say to you that you are to make yourselves very much at home here. Washington, as the capital of the country, is, in fact, the natural and proper home of all national associations, and they are beginning to discover this, for the number of such gatherings here increases every year.

Within the last twenty years this city has become not only one of the most beautiful cities in the world, but has become one of the great scientific and literary centers of this country. The needs of different departments of the Government for accurate and precise information upon many subjects connected with their work have brought together here in the different bureaus many men specially trained in modern methods of investigation and research, each working in some particular line and more or less of an expert upon some one particular subject, yet also interested in the general progress of knowledge and the results obtained by his fellow-workers. Hence

it is that our local scientific societies are numerous, well attended, and have an abundant supply of material to interest their members, more so probably than the majority of local societies in other and larger cities.

Among these associations we number an active and flourishing Microscopical Society, for although the Government has no department or bureau exclusively devoted to this subject, yet in almost every department and in many of the bureaus there are and must be men who are familiar with the use of the microscope, or they could not answer the questions which are liable to come before them at any moment. You may be sure, therefore, that the American Microscopical Society will always find an appreciative and interested audience for its papers and discussions here.

Of the numerous bureaus of the Government which make use of and are interested in the microscope and microscopic technique, there is none which makes more constant use of this method of investigation and none which in times past has done more to stimulate improvements in microscopy than the medical department of the army, including the Army Medical Museum.

The improvements in microscopic objectives which have been made during the last thirty years have been to a considerable extent stimulated, suggested, and given definite direction by the application of photo-micrography to the testing of such objectives as to resolving power and flatness of field under different conditions of illumination.

Photo-micrography, with high powers, became a practicable and useful process when the use of direct sunlight as a means of illumination was introduced. This was first done in this country by Prof. O. N. Rood, of Columbia College, New York, in 1860-'61. It was first suggested and applied in this country to histological preparations in the spring of 1864, in a military hospital here in Washington, by two assistant surgeons in the army, Drs. William Thomson and William F. Norris, both now well-known ophthalmologists in Philadelphia. These gentlemen brought the results obtained by them to the attention of Dr. J. J. Woodward, of the army, who was engaged in the collection of materials for the preparation of the Medical History of the War and the formation of an Army Medical Museum, and by his direction the process was taken up, extended and improved by Dr. Edward Curtis, now of New York, who was then engaged in making microscopic preparations to illustrate the pathological histology of certain camp diseases. Subsequently Dr.

Woodward himself took the matter up, studying especially the optical combinations and technique of illumination adapted to secure the best results, and applying these methods as a means of minutely and accurately comparing the powers and performances of different objectives and of making of such performances records whose accuracy could not be questioned and which could readily be compared with each other. When Dr. Woodward was doing the greater part of his testing work, homogeneous immersion objectives were unknown, and with high powers the proper adjustment of the cover correction was a matter of the greatest importance to secure the best results, and was often a matter of very considerable difficulty. Dr. Woodward's skill and patience in making these adjustments and in the regulation of the illumination were unrivaled—he often spent half an hour and more in securing a single cover correction—and the makers of microscopic objectives, both in this country and abroad, came to recognize the fact that he was not only absolutely impartial in his tests, but would get from each lens the very best work of which it was capable. The result was that they were glad to send him lenses for trial and to obtain his suggestions as to possible means of improvement, which in this way was strongly stimulated.

Since his death microscopic and photo-micrographic work has been carried on steadily in the museum, but on somewhat different lines, consisting mainly in the practical application of these methods to pathological research and to bacteriology. We shall be very glad to have you spend as much time at the museum as you can spare, and to show you what we are doing there. In this connection I wish to invite your attention to two cases at the south end of the main museum hall, which contain a number of microscopes illustrating the development of and changes in this instrument and its accessories from the time of the first known compound microscope of Janssens, in 1680, down to the present time. In bringing together this collection during the last ten years, I have been greatly aided by Mr. John Mayall, of London, who has had so much to do with the formation of the magnificent collection of Mr. Crisp. Permit me to remind you that as citizens and sovereigns of the Republic, the Medical Museum belongs to you, and that as American microscopists, its collection of microscopes and microscopic slides and material should be a matter for your special interest and care. The collection is very far from being complete. It is only the beginning of what I hope will one day be gathered and carefully preserved in it,

namely, a specimen of every different form of microscope, and especially of the earlier forms of American makers, of which we have none, and also specimens of the best work of American microscopists which can be shown by permanent preparations, and to secure this I ask your assistance.

The Library of the Surgeon General's Office, which is connected with the museum, is rich in books and journals relating to the microscope and its uses, especially in its applications to biology and the medical sciences, and is available to all who wish to use it. If you are not familiar with its resources and its index, I hope you will become so while you are here.

I speak first and chiefly of the Army Medical Museum and Library simply because it is the division of the Government with which I happen to be most familiar, but you will find microscopical work going on in the Department of Agriculture, in the National Museum, and elsewhere, and in all these places you will be welcome visitors.

Addresses of welcome are, I think, usually satisfactory in the inverse proportion of their length; hence I will take up no more of your time, and close as I began, by assuring you that we are all very glad to see you here, and hope that you will make yourselves entirely at home with us, and ask for anything you want, even if you don't get it.

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At the close of the address of Dr. Billings, Dr. Thomas Taylor, president of the Washington Microscopical Society, rose and welcomed the visitors, as follows:

*Mr. President and Gentlemen:* After the valuable address just delivered by Dr. Billings, abounding with so much interesting information concerning microscopic research, I do not know that there is anything of importance left for me to say. If I may be permitted, however, I should like while welcoming you to Washington to make a few remarks as to my personal experience in microscopic investigation.

Dr. Billings has particularly referred to the invaluable work of the late Dr. Woodward, of world-wide fame. About twenty years ago I made my first call upon him, with the view of investigating under one of his microscopes a maple leaf which was covered with beautifully colored rings caused by insects. The Doctor received me pleasantly and requested Dr. Schaeffer, his first assistant, to fur-

nish me with a suitable microscope and dissecting needles, so that I might be able to make drawings of the larvæ contained in the pustules on the leaf. This was the first compound microscope I had had the pleasure of using, but many years prior to this my attention had been called to the use of the microscope as an instrument of interest and scientific value by the late Dr. Thomas Dick, of Dundee, Scotland, author of "The Mental and Moral Illumination of Mankind." In this work he describes the compound microscope and its uses. On reading his treatise I decided to purchase my first microscope. It was, of course, a small one, and of very low power, as you may judge, when I say that it cost five shillings, equal in United States money to \$1.25. I used this microscope considerably on large objects with much interest, but made no further effort until the time when I met Dr. Woodward, twenty years ago, and about that time I became acquainted with Dr. Billings, who had already given much of his time to the study of microscopic fungi. I recollect with pleasure how readily he would investigate microscopic objects at my request. We meet here again to-day, he to deliver an address of welcome to the American Society of Microscopists and I to respond to him, as president of the Washington Microscopical Society.

My first official work in the use of the microscope was done at the request of Mr. William Saunders, superintendent of the gardens and grounds of the Department of Agriculture. My dissections and drawing of the maple-leaf larvæ having been shown to him, he suggested that I might make examination of the mildews of the grape-vine, especially that of the foreign grape-vine cultivated under glass, a subject which at that time interested him very much. This fungus was then named *Oidium tuckeri*. On comparing my drawings made of this fungus with those of the oidium of the foreign grape-vine grown in European countries, they seemed identical. Soon after, however, I discovered for the first time the *perithecium*, the higher fruit of this fungus, which, although much sought after, had never been observed before on *Vitis vinifera*. The Rev. J. M. Berkeley has publicly accorded this discovery to me in a letter published in the London *Gardeners Chronicle*. Ultimately a division of microscopy was established in the Department of Agriculture. This was the first division of microscopy established under any Government. The Government of Spain several years after this established such a division, and there is now a division of microscopy in connection with the United States Internal Revenue Bureau.

When I first commenced my investigation of cryptogamic plants I had very little idea of what had been accomplished in European countries or of the important work of a few botanists in the United States, but I gradually acquired some knowledge of these plants. This was in 1871, and in 1876 I prepared an exhibit of drawings for the Centennial Exposition, held in Philadelphia, of fungi, including the edible and poisonous mushrooms. This collection of water-color drawings was probably the largest of the kind ever exhibited, and filled a space 225 feet long by 5 feet high. This collection is now in the possession of the Secretary of the Smithsonian Institution, and it is intended to give it a permanent place in the National Museum. A committee of botanists was appointed to report on this exhibit and I received from their hands a certificate of award for the extent of the collection, the beauty of coloring, and exactness of drawing. Subsequently I prepared a second exhibit of a similar character for the New Orleans Exposition. This collection was highly commended by Professor Bessey, in a communication to the Botanical Magazine, and he recommended in his general review of my botanical collection on exhibition that the Government should publish it.

I am much pleased, Mr. President and members of the American Society of Microscopists, to cordially welcome you, in the name of the Society of which I am President, to Washington to hold your fourteenth annual meeting. I am glad to learn of the continued addition of members to this Society, largely, I believe, owing to the high scientific standing of your President and general officers. The time has well nigh come for the election of a new president and of other officers for your Society, and I can only hope that in our approaching selection of these gentlemen we shall be just as fortunate.

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RESPONSE BY THE PRESIDENT, DR. F. L. JAMES.

*Gentlemen of the Washington Microscopical Society and Dr. Billings:* In response to your kind words of welcome I have only to say that the American Society of Microscopists thank you for your kind and hospitable invitation to avail ourselves of the many scientific attractions of Washington.

Dr. Billings' address recalls to my mind very vividly an address delivered several years ago by an honored past president of this Society, Governor Jacob D. Cox, of Cincinnati, who, I deeply regret, is not with us on this occasion. It was delivered at the Rochester

meeting, in 1884, if I remember aright, and the Society had as its guest the president of the Royal Microscopical Society, the Rev. Dr. Dallinger. The subject was the great battle fought by two former members of this Society now gone over to the silent majority, the ever-honored and illustrious Spencer, and his pupil and rival lens-maker, Tolles, in their struggle for the introduction of the principle of immersion. Professor Cox told in his eloquent manner the details of the great fight and of the part played by Colonel Woodward conducive to the final triumph of the principle that revolutionized microscopy. The speaker frequently referred to and described the experiments made by Colonel Woodward in the laboratory here, so eloquently referred to by Dr. Billings, and which you will see to-day. To the microscopist who knows the history of the instrument that he works with, this laboratory is classic, even hallowed, ground; and again, in the name of the Society over which I have the honor to preside, I return thanks for the privilege accorded of visiting and inspecting the Government laboratories.

To the Society and our friends here assembled, I would say that while during the prevalence of the existing heated term we cannot be expected to do much physical work, yet we intend to make the most of these opportunities so generously tendered us. The program, as I see, has made no mention of the usual annual working session. We can the more readily dispense, however, with this feature of our annual meetings, since by the arrangements of the local society every afternoon is a "working session," whereat we can witness all forms of microscopical work being done by masters in their various lines.

As we have a large amount of important work ahead of us and since our time is necessarily limited, I will not detain you further, but declare the fourteenth annual session of the American Society of Microscopists now open.

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After the opening addresses the election of new members was proposed, but postponed to the next meeting.

The Secretary reported that 2,000 circulars had been distributed to members and others interested in microscopy, in June, and that Dr. James had a similar circular inserted in a large number of the medical journals.

The committees appointed last year were on the World's Fair, on Medico-Legal Microscopy, and a committee holding over on Re-



vision of the Constitution. This latter committee was appointed five years ago, and it was time it finished its work.

As there was no program for Wednesday evening, and no time in the afternoon to read papers, it would be well to have a business session on that evening.

No chairman of the working session was appointed last year, and while at this meeting a different method of showing manipulation will be adopted, a chairman for next year should be appointed ; also it may be best to consider the working session at the Columbian Exposition or World's Fair.

The report of the Committee on the World's Columbian Exposition was called for, and Dr. McIntosh reported as follows :

"I have not much of a report to make, as the directors of the Exposition have not reached allotment space, etc."

This committee was appointed at the Detroit meeting, and was composed of the following members : W. H. Seaman, J. D. Cox, J. A. Miller, Henry L. Tolman, M. D. Ewell, and L. D. McIntosh.

By mutual consent the committee was divided, the first three to communicate with the foreign societies and the last three with the American societies. Last February I wrote the following letter to Director-General Davis :

CHICAGO, *February 7, 1891.*

MR. GEORGE R. DAVIS,

*Director-General, World's Columbian Exposition, Chicago, Ill.*

DEAR SIR: At the meeting of the American Microscopical Society, held at Detroit last August, it was proposed and unanimously approved that an exhibit should be made by foreign, American, State, and local societies and individual workers, and so arranged in connection with or near the optical exhibits of microscopical apparatus, etc., which would show the progress of this line of scientific work and investigation. I then proposed to the Society that in connection with this exhibit a grand educational feature be added by including all the sciences, and not only make exhibits of scientific instruments, but have a large hall, with working rooms or laboratories for arranging specimens, adjusting apparatus for illustration, and have a lecture delivered every day on some scientific subject, fully illustrated with suitable apparatus. This would add a feature to the scientific educational exhibit which has never been brought out before at any World's Fair in this country or Europe. Scientific men of note could be engaged to deliver one or more lectures, each choosing his specialty, and makers of scientific instruments would willingly loan such apparatus and instruments for illustrating such lectures. Aside from these lectures, working sessions illustrating all the scientific departments (such as microscopy, chemistry, philosophy, etc.) could be conducted by professors or advanced students. The sciences

thus brought out would present a grand educational feature, which would call advanced teachers, scientists, and students from America and Europe. The above idea was received by the Society very favorably. Ex-Governor Cox, of Ohio ; Professor Seaman, of Washington ; Professor Gage, of Cornell University, and others heartily approved the idea and suggested as a Society we do all in our power to induce the microscopical and other scientific societies to work to the above end. A committee was then appointed, including the following members : Ex-Governor Cox, Ohio ; Professor Seaman, Washington, D. C. ; J. A. Miller, Ph. D., Buffalo, N. Y. ; Prof. M. D. Ewell, Henry L. Tolman, and L. D. McIntosh, of Chicago, Ill. The first three, with Professor Seaman chairman and secretary, were directed to communicate with the foreign microscopical societies, and the last three, L. D. McIntosh chairman and secretary, to communicate with the American societies. We are now communicating with the societies and leading microscopists in regard to the above exhibit and work. To carry out the above idea a large hall of sufficient seating capacity would be needed, so arranged that it could be darkened. It should have a south exposure, so direct sunlight could be obtained for optical experiments, and operating solar microscopes, stereopticons, spectroscopes, etc. It should have connection with an electric light circuit and arrangements for using all kinds of projection apparatus and giving illustrations with electrical, philosophical, and chemical instruments. Rooms should also be connected with this hall, to be used as working laboratories. There would be no expense to the Exposition but the hall and rooms. Apparatus and instruments the makers would willingly furnish. Should the above plan be favorably received by you, we will gladly do all in our power to aid you in carrying out the details.

Yours truly,

L. D. MCINTOSH,

*Chairman of American Committee.*

The following reply was received :

Dr. L. D. MCINTOSH,

*American Microscopical Society, Chicago, Ill.*

DEAR SIR : I am in receipt of your favor of even date in reference to an exhibit at the World's Columbian Exposition.

The same will be placed on file for consideration in due time.

Yours very truly,

GEORGE R. DAVIS,

*Director-General.*

Several times the committee called on the managers of the exposition and were very courteously received. I called on the Director-General a few days before leaving Chicago to attend this meeting, and was introduced to Chas. C. Bonney, president of the World's Congress, Auxiliary of the World's Columbian Exposition. He informed me that the object of this auxiliary is to provide for the proper presentation of the intellectual, moral, and scientific prog-

ress of the world, to provide places and meeting for congresses and societies, etc. He gave me a series of circulars setting forth the above idea, which I wish the members of this Society to look over.

Mr. Bonney told me that plans were already matured by which large and small halls would be furnished for meetings, lectures, etc., and I think this feature will be carried out. There has been a local committee appointed at Chicago to aid in this work. Now, it seems to me that all we have to do is to go on with our work and make arrangements to hold our meeting in Chicago in 1893.

Dr. Fell: I move that the report be received, and that the committee be retained.

This was seconded by Professor Gage and carried.

Dr. McIntosh: This committee needs assistance. Mr. Bonney requested 40 or 50 names of those who stood well in this Society, that they might be appointed corresponding members.

Professor Kellicott: I want to get the thought clear. Does the report foreshadow that we hold our annual meeting in July, 1893?

Dr. McIntosh: It does.

Professor Seaman: I take it that they want the names furnished, so that they can draw from them.

Dr. Fell: It seems to me that the committee are able to suggest those names, as well as the nominating committee.

Dr. McIntosh: I think other members of the Society are better acquainted with the best workers than I am. I would like some suggestions.

Dr. W. J. Lewis: Does he want names of members of the Society or any outside microscopists on the Society committee?

Dr. McIntosh: Names of members of the Society.

Dr. W. J. Lewis: I will make a motion that the committee be instructed to do the best they can.

The motion was carried.

The Secretary then asked the question: Shall the Society be incorporated? I will state the matter as it appears to my own mind. I have had no correspondence with the members. This Society has a large membership, with no legal right to hold property. The officers are responsible personally, but the Society is not known in law. This Society ought to have a property fund, so that it can improve its proceedings. Men of wealth are not going to leave money to it when they die, unless the Society has a legal existence.

We have a small amount of money, but as far as the Society goes, it belongs to the man who is treasurer.

The President: The difficulties in the way are not so great, and I am in favor of gaining advantage of the excellent laws of the District. There can be no questioning of the advantage of incorporating the Society. I should like to hear from ex-President Lewis.

Mr. Lewis: I do not know that I have anything to say, except in favor of it. It can be done.

Mr. Mellor made the motion "that the Society be incorporated;" which motion was seconded and carried.

Dr. Reyburn, Mr. Yznaga, and Dr. William J. Lewis were appointed a Committee on Incorporation.

Dr. McIntosh's paper was called for, but it was decided to defer the reading of it until Wednesday morning.

An announcement was made that room No. 7, Columbian University, would be the general headquarters, where telephones, etc., were at the service of the visiting members.

The meeting then adjourned at two o'clock, to visit the Geological Survey and to meet at the Congregational Church, corner of Tenth and G streets, at 8 o'clock p. m.

Tuesday afternoon the Society visited the Geological Survey, in the Hooe building, on F street. For about two hours we were most agreeably entertained in seeing the processes of making sections of rocks for the microscope, of making maps, and in the photographic rooms of the survey. From the top of the building one of the most interesting views of the city of Washington may be seen.

At 8 o'clock in the evening the Society and a number of visitors again assembled in the west parlor of the First Congregational Church, corner Tenth and G streets.

In the absence of the vice-presidents, Dr. Reyburn introduced the president, Dr. James, who proceeded to deliver the annual address, on "The microscope in the investigation of burns and scorches on textile fabrics."

At the conclusion of the address the meeting adjourned.

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WEDNESDAY MORNING, *August 12, 1891.*

The meeting opened at 10 o'clock with forty-five members present.

The election of new members was the first business in order. Forty-two names were presented as recommended by the Executive Committee. They will be found in the list of members.

The President remarked that there had never been so large a list

presented on the first day. They came from all parts of the country—from Portland, Maine, to Portland, Oregon.

It was agreed to hold a business meeting at 8 o'clock p. m.

The Secretary read a letter from Vice-President Ewell and Francis Wolle, and noted the receipt of letters from several members expressing their interest in the meeting and their regrets that circumstances prevented their attendance.

The first paper was by Dr. L. McIntosh, on "A Portable Lime Light." After the reading and exhibition of the apparatus, Dr. Taylor inquired as to the object of the heating lamp and the mode of using the retort, as the lamp flamed a little at first. Several other inquiries were made, which are answered in the paper itself, on page 41.

After the discussion Dr. Taylor remarked on the great advantages of such a portable apparatus, and Dr. McIntosh said he had never used any instrument with so much satisfaction.

The report of the Committee on Incorporation being called for, Dr. Reyburn, as chairman of the committee, reported in favor of incorporating under the name of the American Microscopical Society, and read the instrument as prepared.

On request, Professor Claypole took the chair.

Dr. James said that at the time of our organization the name of the American Society of Microscopists was selected because there was then a society in New York calling itself the American Microscopical Society. He believed this society had never been incorporated, and that it was no longer in existence,\* and he very much preferred the name which the committee presented, viz., The American Microscopical Society.

Dr. Taylor: I am in favor of the old name; I like it better than the one proposed. All the different societies use this name; we had better have something new. Americans are always getting up something new.

Dr. Reyburn: Look at the names of other societies—The Royal Microscopical Society, The Manchester Microscopical Society, etc.

Dr. Lewis: People come to me and say, Can you tell me anything about that society of — ? When they get to that word they say, Can you tell me how to pronounce that name? I am heartily in favor of changing the name. The old name is harsh; the word means one who looks through a microscope, occasionally or other-

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\* It was afterwards found the New York society was not dissolved.

wise. The name Microscopical Society gives a different object to the society.

Dr. Taylor: Does the meaning of the name make a small society?

Dr. Lewis in the chair.

Professor Claypole: The same question came up in the Geological Society, and the name "American Geological Society" was adopted chiefly as a matter of convenience. In the Royal Microscopical Society it would make a long string of letters to call the members Fellows of the Royal Society of Microscopists.

Professor Gage: I am in favor of this change because, as you yourself have said, the word microscopist is so hard to pronounce. Not one man in fifty can pronounce it without hesitating. As a matter of expediency, to keep good-natured, we had better change it.

Dr. Taylor: We are simply keeping up with the times in pronouncing the word. I was asked the same question in the Agricultural Department the other day by a member of the House, because he was afraid to pronounce it. A lawyer at Philadelphia laughed right out at the word, because he could not pronounce it.

Dr. Lewis: All in favor of changing the name of the Society in the articles of incorporation from the American Society of Microscopists to the name of the American Microscopical Society will signify it by the usual sign.

The ayes have it.

Dr. Reyburn moved that the term "twenty years" be inserted in the articles.

Dr. W. J. Lewis seconded the motion, and it was carried.

The President remarked that the Executive Committee was a part of the governing body. The names were inserted.

The second paper of the morning was "The Microscope in Government Work," by Dr. J. Melvin Lamb.

After the reading, Dr. Taylor said: Mr. President and gentlemen, this paper will be of great use hereafter, and I think that the thanks of this Society should be extended to Dr. Lamb for his excellent paper. Before making the motion I wish to call attention to the fact that my polariscope, of the same character, was made several years before Mr. Richards made his. I now make the motion that Dr. Lamb receive a special vote of thanks for his excellent paper.

This motion was seconded by Dr. George A. Fell, of Buffalo, who

said : I am in favor of giving Dr. Lamb a special vote of thanks for his interesting paper.

The motion was carried.

A new microscope was then exhibited by Mr. Bausch (described on page 116).

The next paper was by Dr. James M. Flint—"Apparatus for public and class exhibitions of microscopic objects." The apparatus was shown.

Dr. Thomas Taylor : Mr. Chairman, before making a few remarks I want to say that I am somewhat surprised at the aggressiveness of the last gentleman. He is rolling past the rest of us. It is curious that I am a worker in the same line myself. I am having such an instrument made by Queen & Co. It will be here before the end of the meeting. Mine differs from his in that it is prepared for transparent and not for opaque objects. There are eleven objects on the slide prepared for special use ; you just revolve it. But I confess the gentleman has got a long way ahead of me in his general work ; his apparatus is very ingenious, and will have its use in school teaching and other work. I found it necessary in my work of examining wools to have slides that could be changed easily, my method of doing which will appear hereafter.

From Report of the Microscopist, United States Department of Agriculture, for 1891.  
By Thomas Taylor, M. D. See Figs. 8 and 9, page 31.

#### REVOLVING STAGE FOR VIEWING MICROSCOPIC SECTIONS, ETC.

The figure exhibits a view of a new and improved form of revolving brass plate which I have recently devised in order to supply a need long felt in the division. It may be attached to any microscope, and is designed principally for reviewing and comparing serial sections and textile fibers. This revolving plate is pivoted upon the substage by means of a downward-projecting pin. It may thus be rotated freely at the pleasure of the operator. Slides mounted with subjects for investigation and comparison are secured by means of spring-clips upon the surface of the plate.

A stage of this description which I am accustomed to use exhibits eleven different samples of wools. In jury trials relating to wools I have found it sometimes desirable to have six microscopes in use at one time in illustrating the respective characteristics of various samples of wool. Even with this number the parties are seldom satisfied, as one person is obliged to move from one instrument to another, interfering perhaps with the view of other observers. The system I have initiated saves much time—an important consideration in the court-room. By means

of the revolving plate, eleven diverse samples may be compared in less time than an observer could move from one microscope to another.

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I use a similar form for high powers, consisting of perfectly clear glass 2 millimeters in thickness, circular in form like the preceding, and, like it, attachable to the plane stage of a microscope. On this plate the objects may be arranged upon its margin the same as on the usual glass slides, and the cover-glass fixed upon them, thus dispensing with clips, which interfere somewhat with the objective when using high powers; or the plate may be perforated, as in the metal plate, the mounts fixed by means of wax or a drop of paraffine at the edges of the slides. This method, I find, renders the object sufficiently steady for examination, and the wax has the advantage of being easily removed when it has answered the purpose, leaving a clean plate for change of subject or for further investigation. The diameter of the revolving plate is only limited by the construction of the microscope stand, to which it is an adjunct.

The Secretary then announced that the photographer would come at noon to take a picture of the Society, and also that the Society would visit the Department of Agriculture at 1.30 o'clock.

It was also decided that the Nominating Committee should be appointed at the business meeting in the evening instead of waiting until the Thursday morning session, as was usually done.

The Society was then adjourned until the evening hour.

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#### WEDNESDAY EVENING, *August 12, 1891.*

The meeting opened at 8 o'clock, with twenty-five members present.

Dr. James announced that the first thing in order was the report of the Committee on Constitution.

Dr. W. J. Lewis made the following report: Inasmuch as the Society is to be incorporated, it will require some changes; so I would suggest that the old committee be dissolved and the matter be put into the hands of the Executive Committee. I therefore make a motion that the Constitution be placed in the hands of the Executive Committee, to be elaborated under the new incorporation and to be reported at a future meeting.

Dr. Taylor: Will this affect the incorporation?

Dr. Lewis: No.

Professor Claypole: Is it not necessary to discharge the old committee before placing it in the hands of the Executive Committee?



Professor Seaman: This committee was appointed five years ago. This question has been unsettled all this time. I have no objection to the change, but think there are some points that the Society must settle to-night—the name, for example.

Dr. James: That was settled this morning.

Dr. Lewis's motion was then carried.

Dr. Taylor: I would like to suggest that it might facilitate the matter if the gentlemen on the committee were Washingtonians.

Dr. James: Two of the committee are from Washington.

Dr. Reyburn: Are only three names to go on the articles of incorporation?

Dr. Taylor: Sometimes twenty names are used.

Mr. Yznaga: Three or more are necessary. The majority must be Washingtonians. This paper has been compared and drawn up according to the requirements of the laws of the District.

Dr. James: What is the pleasure of the Society in adding names to those already named? I should suggest that this be done. It is not necessary to name these parties; the committee can add these names as they find need.

Mr. Yznaga: It is necessary that the majority of persons who sign this paper before the notary public be selected from the Washington residents.

Dr. Reyburn read the articles, and then said the committee would like four or five more names, as it would make a better appearance on the paper.

Mr. Yznaga made a motion that these names be added.

Dr. W. J. Lewis made reply that the committee could get some others to sign it. They can easily fill out those names.

Dr. James then put the motion, and it was carried.

Dr. Seaman: It has been very well settled. I would say that it will add to the dignity of the paper to have all the names possible.

Dr. James: Next in order is the selection of a Nominating Committee for the choice of officers for the ensuing year.

Dr. Fell nominated Professor Kellicott as chairman of the committee.

Dr. James said: There must be seven names.

The following names were put before the Society:

Chairman, Professor Kellicott; Professor Gage, Dr. Reyburn, Dr. Lewis, Dr. Fell, Dr. Lamb, and Dr. McIntosh.

It was moved and seconded that the nominations be closed.

Dr. Fell moved that the Secretary cast the ballot for the Society. This was seconded and carried.

Professor Gage : In view of the fact that the working session ought to be a prominent feature of our Chicago meeting in 1893, we should appoint a director now. He ought to have plenty of time to get ready, if he is to make it a success.

Professor Kellicott : I second that.

Dr. James : It is moved that the Nominating Committee be authorized to suggest the name of a director for the working session at the Columbian Fair.

This motion was carried.

Dr. Kellicott asked the committee to meet immediately after the adjournment of the meeting.

Dr. W. J. Lewis : I move that the number of proceedings printed be increased from 600 to 750 copies. This matter was brought up before the Executive Committee, and it seems necessary to do it.

Professor Gage : I would like to amend the motion and increase it to 1,000.

Dr. Lewis : That matter was carefully considered. We thought that 750 would leave us about 150 copies to distribute to public libraries, etc., and that left us about 150 for other purposes. The cost of publication is nearly the same for 500, 750, or 1,000.

Professor Gage withdrew his motion.

Professor Kellicott : I am heartily in favor of increasing the number. The only question is whether the Society can afford it. I think Dr. Lewis said, in regard to the Constitution and By-Laws, that when we incorporate as a new Society the old Society is literally wiped out. We cannot make the motion for them to have 500 or 1,000 copies printed.

Dr. Taylor : There is one way of getting over that part. We might delay the consideration of it until the Society had been incorporated.

Dr. James : I would like to hear from Mr. Yznaga.

Mr. Yznaga : I would suggest that the first thing to do to-morrow is to have the certificate of incorporation signed and put on record, and then re-elect all names that are not there.

Professor Kellicott : What is the use of legislating on any of these points to-night ?

Dr. Seaman : When the Executive Committee get to work it will be a nice thing to have the sense of the Society—that is, the Society says to the committee, “ Put in 750 instead of 500 copies. We can-

not have any legislative right, but it will facilitate the work of the committee."

The motion to increase the number of copies from 500 to 750 was put and carried.

Professor Kellicott: I move that full sets of our proceedings be sent to the libraries of Cleveland and Young Men's Association of Buffalo, and that the Secretary be authorized to——

Dr. Lewis: Include Buffalo in your motion; it will save time; and in the place of Cleveland put Cornell.

Mr. Mellor: I think we have only three full sets.

Dr. Fell: I believe we have fifty or sixty sets. I made a report of the number of Proceedings at the Buffalo meeting, so I think we can afford to donate them freely to different institutions, and I move that Cornell, Buffalo, and Cleveland be supplied.

Mr. Mellor: I do not know that there is a set in the Pittsburgh library.

Dr. Fell: Much of the past work of this Society has been done by several Buffalo men. Professor Kellicott and I were engaged there for nine years. I think Buffalo is entitled to it. It may be that the Grosvenor library is supplied. I move that the Grosvenor library be made complete, if not already so.

Seconded by Mr. Garrettson, of Buffalo.

The President called Professor Kellicott to the chair and then went on to say: We cannot pick out either the State of New York or Ohio. We must draw the line somewhere. I shall certainly object to two sets going to one city, since the students can go to either library. We have given Buffalo and Pittsburgh each one set. If we have any to spare, let us give one to Washington.

Dr. Fell: I did not wish, on account of the work, to say that we ought to give to Buffalo. I only desire that these publications that have been lying about for several years should be distributed. I made a schedule of them two years ago. No schedule of them has been made since. I am in favor of the leading scientific libraries of all lands being supplied with them. I think they will do us more good there than locked up. The number that has been sold lately does not seem to show the demand was great. I would like Washington and St. Louis also to be supplied.

The President: It is moved and seconded that the Grosvenor library be filled up.

Professor Kellicott: It seems to me that the original exchange list should be gone over that was made in 1887. There should be

careful legislating. Those continuing on the list should have their sets completed. If Grosvenor library falls in the list it should be supplied; if not, I should conscientiously have to object to it.

Professor Gage : It seems to me that we are making special legislation, which appears to me quite wrong. We ought to have a principle by which libraries should be supplied. We cannot expect them all to buy them. We want to get the respect of the men who frequent libraries.

After some desultory discussion the President said : We shall have to act on Dr. Fell's motion, that the Grosvenor library be included in the list of libraries which shall have their sets filled up to date.

This motion was lost.

Professor Seaman : I wish only to state that all the facts have not been stated. Mr. Mellor has not received all the sets and there has been no distribution made since 1887.

Professor Gage : I move that a committee be appointed by the chairman, and directed to report at a later meeting, so that we can get to work at distributing our volumes.

Professor Kellicott : My mind is not clear enough, but perhaps the Secretary can make it clearer. It seems to me that last year there was some action taken about this. I would ask what that was.

The President : You will find it in Thursday's proceedings of last year. I can find it readily.

Mr. Yznaga announced that a notary would be present before 12 o'clock to-morrow to take acknowledgments of signatures to the certificate of incorporation.

Dr. James then read an extract from the minutes of last year, showing that the whole matter was put in the hands of the Publishing Committee, and Professor Gage withdrew his motion.

Professor Seaman : This matter was carefully studied, and it was thought best not to make further distribution. We have distributed our index to 800 libraries. Since then three complete sets have been sold. As soon as the index was received they sent for the volumes.

Professor Kellicott : As a member of this Society, I would like to have a report from this Publishing Committee on the distribution of the volumes.

The President : I ask that this committee make a report before the close of our meeting.

Dr. W. J. Lewis : I move that Mr. Mellor give a report of the

funds on hand, and that all money from sale of Proceedings be applied to the Spencer-Tolles fund.

Professor Kellicott: I wish Dr. Lewis had confidence enough in me to withdraw the motion.

Dr. Lewis: In consideration of the thunder-storm we have had, I will. I feel very good-natured, now that it is cooler. If it was yesterday I would not do it.

Professor Kellicott: Some years ago a committee was appointed to consider the question whether we should print our Proceedings in a serial or not. That committee reported against that form for the Proceedings. The conditions are somewhat changed now, and I will make a motion to appoint a committee of five to consider and make a report at a later meeting on the advantages of printing a serial publication.

Dr. Lewis: Any wish as to how the committee should be appointed?

Professor Kellicott: A committee appointed by the chair. I would ask Professor Seaman to express his opinion.

The President: Will it not be time enough when the committee makes the report?

Professor Kellicott: I thought it would help them to think about it.

The President: The hour is getting late, and we have a great deal to consider.

The motion for the appointment of a Committee on Periodical Publication was put and carried.

The chair named the following gentlemen as the committee: Professors Kellicott and Gage, Doctors W. J. Lewis, Seaman, and Taylor.

Professor Claypole: The question has been before the Society more than once in regard to securing a uniformity in the screw-threads of our objectives. The differences in this country are great, but the divergence is much greater between the mother country and this. There ought to be some means of securing uniformity. If we have failed to secure the co-operation of the other side of the water, would it not be possible to do something ourselves and get them to join us afterwards? Get as near the Royal Society standard as we can. If we can secure a standard thread as near as possible to their type, they would join us, and it would only be a question of time before the French and German would also. If it is thought advisable I would like to ask that a few members be appointed to see whether the step can be taken.

Mr. Denison : I second that motion, because I found so much difficulty with my own objectives. I have for years had to take mine to a firm in New York to have them adjusted.

The President : How many will you have on the committee—three ?

Dr. Lewis : I am in favor of appointing such a committee. We have had such several times in the past few years, and they come out in the same old way. If we have new members on it we shall have more fun.

The motion was then put, and carried.

The members appointed on this committee were Professors Claypole and Gage and Mr. Bausch.

Dr. Fell : There is a matter I wish to mention, that the members of our Society shall be empowered to purchase at a lower price the volumes which they desire to complete their sets.

The list of papers to be read at the next meeting was announced, and the meeting adjourned.

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THURSDAY MORNING, *August 13, 1891.*

Thirty-five members were present when the hour of ten arrived, which afterwards increased to sixty.

Six new members were elected.

The reports of committees were called for, but were not ready.

Mrs. S. P. Gage then read the paper entitled "A comparison of the epithelium of the mouth in *Necturus* and *Diemyctylus*."

Professor Gage : This was put down as partly my paper, but I did not know what was in it.

Dr. Fell : I do not think any one can listen to a paper like this without feeling very much interested in the thorough work done by Professor and Mrs. Gage.

Professor Seaman then read a paper on "The phosphorescent organs of fire-flies."

Professor Guttenberg : To what class do these fire-flies belong ?

Professor Seaman read from Dubois to show that they belonged to the Coleoptera.

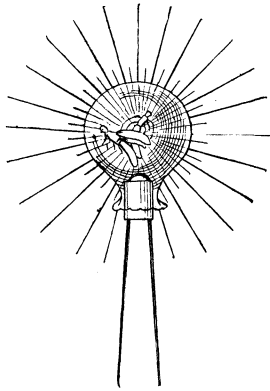
Professor Guttenberg : These have been said to be characteristic of the western hemisphere. I was brought up in the eastern hemisphere, and used to catch lightning-bugs then and study my lessons

by their light. We called them illuminating beetles, which is more appropriate; they are not flies; they are bugs, and not worms. I also wish to state that the amount of heat which they give has been measured by the new bolometer at Allegheny. Their light is 600 times cheaper than any artificial light known.

Several inquiries were made as to staining, etc., that are better answered by the paper itself than entered here.

Dr. Taylor suggested that condensation by chemical action produced changes of temperature, and that the insect, he thought, had an enormous nervous system.

Dr. James described the methods used by the ladies living in those countries where the Pyrophori are found, of passing a hair-pin



through a cork adapted to fit the mouth of a small, round bottle, placing a drop of water in the bottle, and one or more fire-flies, and wearing the ornament in their hair. He also noted the number and beauty of the fire-flies seen in the summer months from the decks of the steamers on the lower Mississippi.

Professor Claypole said: The address given by Professor Seaman is a good illustration of the beginning of a new investigation. I wondered when he was speaking if the attempt at the measurement of the heat given out by the fire-fly was made with an old or a new instrument. It struck me as unlikely that so high an illuminating effect should be utterly devoid of heat.

I am, therefore, glad to learn that Langley's bolometer has been tried, and it would be more satisfactory to try, when an opportunity occurs, the new and more sensitive radiometer of Boys.

Looking back over the evolution of these insects we must, of course, see in imagination a condition in which their ancestors did not give light. From that we must trace the evolution of light-giving organisms. There is apparently this difference between the phenomena in insects and in some other orders of animals, that in the former the property is confined to one group of beetles—the Elateridæ—and among these to the sub-group of Fulguridæ, while among fishes the power of emitting light belongs to several different groups. The same is true of the electrical manifestation in fishes. This characterizes at least two great groups—the sharks, where it is possessed by the electric ray, and Gymnotids, where it is shown by the torpedo or electric eel. It is scarcely possible in the latter case to attribute the phenomena to direct descent from a common ancestor. It seems more probable that in the luminous and electric fishes these powers are of secondary origin, and have developed since these families diverged from a common stock. This, however, is not necessary in the case of the insects, in which we may assume a common parent for all the Fulguridæ.

As to the use of this faculty, I trust we shall hear more in a future paper. Its existence in the larvæ runs counter to the ordinary opinions on the subject.

Dr. Decke then described a heliostat made from a common, cheap clock.

Miss V. A. Latham's paper was then read, "On the microscopical anatomy of a case of chrome lead poisoning."

The report of the committee on incorporation was then called for, and Dr. Lewis stated that the notary would be present at 12 o'clock to take acknowledgments of the signatures.

Dr. James called up the report of the Nominating Committee.

Professor Kellicott, as chairman of the committee, presented the following nominations:

For President—Prof. Marshall D. Ewell, of Chicago, Ill.

For Vice-Presidents—Dr. Robert Reyburn, of Washington, D. C., and Dr. Richard J. Nunn, of Savannah, Ga.

For members of the Executive Committee—Dr. John A. Miller, of Buffalo, N. Y.; Prof. E. W. Claypole, of Akron, Ohio, and Dr. J. Melvin Lamb, of Washington, D. C.

The Secretary, Dr. William H. Seaman, of Washington, D. C., and the Treasurer, C. C. Mellor, of Pittsburgh, Pa., both held over, being elected for three years.



Professor Simon H. Gage was nominated as chairman of the working session at the Columbian Exposition in 1893.

Dr. Lewis said if there was no objection, there was no need of proceeding to a regular ballot.

The President: If there is no opposition, the Secretary will cast the ballot of the Society for the nominations before us.

There being no objection, the ballot was cast, and the officers declared elected.

The presence of the notary was then announced, and the meeting adjourned to give those members whose names appear on the instrument of incorporation the opportunity of signing and acknowledging their signatures thereto. (For the instrument, see preface.)

Thursday afternoon at 2 o'clock the Society visited the Army Medical Museum and Library of the Surgeon General's Office, and a few who were not quite satiated with sight-seeing went to the National Museum adjacent.

The paper by Dr. Lamb, on "The Microscope in Government Work," renders it unnecessary to recite the details of these visits here.

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Thursday evening the Society held its annual soiree in the drill-room of the Armory of the Light Battery and Cavalry Troop, just opposite the place of meeting. The building was erected for a skating rink and, with its broad expanse of floor, was exceedingly well adapted for the purposes of the Society. As there is a certain similarity in these entertainments and they have been several times described in the Proceedings, especially the earlier ones, the Secretary deems it unnecessary to go into details. He desires, however, to place on record his opinion, based on careful observation for a number of years, that these entertainments are one of the most effective means of increasing public interest in and love of the microscope, and that many incidents of a personal nature adapted to support this opinion have come to his knowledge, some of which occurred at this soiree.

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FRIDAY MORNING, *August 14, 1891.*

When the President called the meeting to order at 9 o'clock, there were twenty-two persons present. The number increased to about forty during the progress of the meeting.

Five new members were elected.

The report of the Committee on Medico-Legal Microscopy was asked for.

Professor Claypole, for the committee, said : I have not been able to have a consultation with Professor Ewell, although I tried to arrange an interview when last I was in Chicago. There are two questions in my mind : First, is it worth while to do anything at all in the direction indicated ; and, if so, how should it be done ?

The only feasible and practically useful plan would be to take up the subject of the power of the microscope to distinguish certain objects that are very like each other, and to show what can and what cannot be expected of it.

As examples, I refer to the distinguishing of starches and various animal tissues, such as hair, wool, skin, blood, etc.

Your committee would like to know whether, in the opinion of the Society, it is worth while to continue the subject—that is, to have a paper prepared for publication giving their opinions.

Professor Kellicott : If these experts will give us a paper I will be glad to see it published, but I would not like to put my name to it and have it published as from the Society.

The committee were discharged.

The local committee reported announcements to make at the end of the meeting, and the Committee on Journal were called for.

Professor Kellicott reported but slow progress.

Dr. Lewis moved the committee be discharged.

The President remarked it might be suffered to expire with the old Society.

The report of the Treasurer was read and accepted. It is found on page —.

The Committee on Constitution, through Dr. Wm. J. Lewis, reported as follows :

*Resolved*, I. That all members of the American Society of Microscopists in good standing be, and hereby are, elected to membership in the American Microscopical Society.

II. That the American Society of Microscopists donates all of its property to the American Microscopical Society.

III. That the following Constitution is hereby adopted by the American Microscopical Society, to wit :

*Constitution of the American Microscopical Society.*

ARTICLE I. Any person interested in microscopical science may become a member of the Society upon recommendation in writing by two members, nomination by the Executive Committee, and election by a majority

of the members of the Society present at any regular session of the Society.

ART. II. The officers of this Society shall consist of a President and two Vice-Presidents, together with a Secretary and Treasurer.

ART. III. The duties of the officers shall be the same as are usual in similar organizations, in addition to which it shall be the duty of the President to deliver an address during the meeting at which he presides, and of the Treasurer to act as custodian of the property of the Society.

ART. IV. There shall be an Executive Committee, consisting of the officers of the Society, the past Presidents of the American Society of Microscopists and three members elected by the Society.

ART. V. It shall be the duty of the Executive Committee to fix the time and place of meeting and manage the general affairs of the Society.

ART. VI. The initiation fee shall be three dollars and the dues shall be two dollars annually.

Also that the Executive Committee of the American Microscopical Society be instructed to draft a new Constitution and By-Laws and submit the same for action at the next annual meeting.

V. That Prof. S. H. Gage be appointed chairman of a committee on practical demonstration and exhibition for the annual meeting of 1893.

VI. That Dr. John A. Miller, of Buffalo, N. Y.; Prof. E. W. Claypole, of Akron, Ohio, and Dr. J. Melvin Lamb, of Washington, D. C., are elected members of the Executive Committee for the following year.

VII. The Treasurer is instructed to obtain and take charge of "Standard Centimeter A" in the name of the Society.

The report of the Committee on Constitution was adopted by the Society.

Dr. Lewis then offered the following resolutions, by request :

*Resolved*, That the American Microscopical Society regards the present prohibitory duties upon optical and philosophical instruments, and especially upon microscopical objectives, as a tax upon knowledge and education and as a grievous burden upon students and others least able to bear it.

*Resolved further*, That the American Microscopical Society solicits the co-operation of the American Association for the Advancement of Science, the State and local microscopical societies, the schools and colleges, the American Pharmaceutical Association, the American Medical Association, and all similar institutions and organizations in petitioning Congress to lessen or entirely remove the said import duties, which it can be shown are far in excess of the protection needed by American opticians.

*Resolved further*, That the president of the American Microscopical Society appoint suitable committees to visit or communicate with the organizations and institutions above named to solicit immediate action in the direction indicated.

The resolutions were passed.

The first paper of the morning was by Robert O. Moody, on "The arrangement of the muscular layers of the intestines of the cat at the junction of the large and small intestine."

Professor Gage : There is hardly anything apparently simple on its face but which turns out on investigation to be very complex. When Mr. Moody first spoke to me about this matter I did not think it would be very difficult. I say this because I hope that teachers who have pupils inclined to make investigations will encourage them ; possibly it may put us on the track of important contributions to our knowledge.

At this time Dr. J. Melvin Lamb, on behalf of the Washington Microscopical Society, tendered to the visiting members of the American Society an excursion to Mt. Vernon on Saturday (to-morrow) morning at ten o'clock.

Dr. Thomas Taylor then explained an instrument for the exhibition of a large number of specimens of wool, mounted on the circumference of a revolving stage about eighteen inches in diameter, and explained a method of detecting lard adulterations.

Professor Claypole in the chair.

The name of Harry G. Wales, received last year too late for election, was proposed and he was elected to membership in the American Microscopical Society on motion of Dr. W. J. Lewis.

Dr. V. A. Moore then read a paper, "Observations on staining the flagella of motile bacteria."

Professor Claypole said : The method of Dr. Moore, if it fulfills the promise it has made to-day, will be an immense advance in the study of bacteriology, by rendering comparatively easy what has thus far been one of the most difficult observations—the clear seeing of the flagella. I have twice heard Dr. Dallinger ascribe the intense difficulty he experienced in rendering visible some of these organs ; but Dr. Moore's treatment brings into sight these almost invisible filaments and renders them easily visible. The total absence, according to the speaker, of all traces of the flagella in the non-motile forms is also exceedingly significant as tending to confirm the observations and increase the value of the method. It has long been a puzzle to know how the motile forms could be distinguished from the non-motile ones, except by movement ; but if the flagella can be thus easily brought into view no further difficulty will be encountered here. We may hope that Dr. Moore's further experiments will confirm and extend his present results. I should like to know what power was used in these observations.

Dr. Moore : A one-eighteenth, with No. 2 eye-piece.

Dr. James now read the necrology for the year as follows :\*

Dr. F. W. Brayton, Carey, Ohio ; elected August 21, 1889 ; died December 4, 1891.

Fred. G. Perry, Boston, Mass. ; elected August 20, 1889 ; died November, 1890.

J. L. Smith, New York city.

Dr. H. A. Johnson, of Chicago, Ill.

Dr. Howe's paper was called, but, as he was absent, it was read by title, and Professor Stedman read his papers on "The nervous system of fresh-water sponges," and on "Killing invertebrata in an expanded condition."

Miss V. A. Latham remarked : The method of killing invertebrata referred to by Dr. Stedman has been noticed, I believe, in various microscopical journals, and it may be of interest to call attention to the series of articles in the *International Journal of Microscopy and Natural Science*, July and August, 1891 ; also previous articles on "Infusoria," etc., and "Methods of preparation," and "The alcoholic method of treating Bryozoa and Hydrozoa," in *The Microscopist* for 1888 and 1889. An agent which will be useful to the experimenter in pond life is "Listerine." A 6 per cent. solution retards the motion of all ciliated infusoria, vorticella, etc. ; a strong solution is immediate death to all the lower animals. It promptly arrests the motion of such algæ as diatoms and oscillatoria, etc. ; also the motion of sponges during the process of spore formation. A 30 to 50 per cent. solution prevents moulds on gum mixtures used in freezing sections. Animal tissues are preserved in it if used full strength. One method I have used for years is to take protozoa preserved in alcohol, place on slip, flood with strong carbolic acid, allow surplus to drain from one corner, apply a cover-glass coated with Canada balsam, and the balsam replaces the carbolic acid. There is little or no shrinkage. It answers well for both the insect and vegetable specimens, causing in the former protrusion of the mouth parts, and penetrating large insects.

Dr. Taylor : I found out long ago alcohol contracted insects, and that I must put them in chloroform to expand them.

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\*John Mayall, Jr., of London, Eng. ; born January 7, 1842 ; died of pleuro-pneumonia July 27, 1891. He was well known as a collector of old microscopes and the author of the lectures on the development of the microscope. *Journal of the Society of Arts*, London, 1886, page 907.

Dr. James: I have used osmic acid and found nothing so good.

Professor Kellicott: For rotifers osmic acid has no equal. I have experimented with other things, but always go back to it. The solution of iodine I do not favor so much, though it is very good as a preservative.

Dr. James: If you will place a drop of a 1 or 2 per cent. solution of osmic acid on your finger and prick through it so it will bleed, you will have a perfect fixation of the elements of the blood. Dr. Ranvier dwells on it as the most valuable of anything that we can have for a fixative. I have never found it to disappoint me.

Professor Gage: I would like Dr. James to use it for fixing the red corpuscles of lamprey eels. I think he would fail.

Professor Claypole, in the chair, called for Professor Gage's papers on "Notes on the fixation of serial sections" and "Preparation of the fibrin filaments of the blood."

Dr. V. A. Moore: If this staining brings out the fibrin filaments can it be applied to the tissues and exudations in which the fibrin is supposed to be present?

Professor Gage: I do not believe it could. I simply recommend the method where perfectly fresh blood is obtainable.

Dr. J. M. Lamb: In addition to the discussion on preservatives and fixatives, I should like to add a suggestion to the method described by Dr. James, and which I have found exceedingly advantageous in the preparation of a large number or quantity of specimens at one time. Instead of the fixing of a slide full of corpuscles (blood) I would employ a small-size, wide-mouth jar, a capacity of, say,  $1\frac{1}{2}$  to 2 ounces. Have in this your  $\frac{1}{2}$  or 1 per cent. osmic acid solution; puncture the artery or vein of the animal and immediately insert a pipette, with bulb, and draw into it a large quantity of blood; eject this into the jar with osmic acid; repeat several times until the quantity collected is sufficient. In this manner a vast number of corpuscles are secured and fixed with perfect result.

If the animal and vessel permit, without the introduction of extraneous matter or tissues, the blood may be run in direct from the bleeding vessel. The corpuscles are rapidly fixed. After a short time the corpuscles subside, the supernatant acid mixture may be decanted and the deposit of corpuscles thoroughly washed with water in like manner until freed from acid, after which they may be preserved in glycerine or stained. I have prepared a large *stock* in this manner for class demonstration of corpuscles of especial interest.

I listened with great interest to Professor Gage's excellent paper on the "Fixation of serial sections and the collodion method in histology," as I consider it one of the more important questions of microscopic technique. The Schällibaum collodion method is familiar to us all, and likewise its serious disadvantages—*e. g.*, the dislocation of sections, and, as the Professor truly remarks, "always the better sections." It is a pleasant method, and for general purposes is found to work well. For the purpose described in Professor Gage's paper, I am sure the albumen method (as described by him) will insure far better and more positive results. For serial work, especially when the sections are above the average dimensions, the collodion method will prove tedious and uncertain as compared with the albumen process.

In this connection I beg to add a few words in favor of a method which has proved very efficient for fixation of serial sections. The merits of this method are simplicity, certainty of results, expansion of the sections though wrinkled, and arrangement of the sections on the slide. The method is described by Dr. G. A. Piersol, in, I believe, the *University Medical Magazine*. He employs a strong, almost saturated, aqueous solution of best gum arabic; about 25 gtt. are added to 25 cc. distilled water, and a crystal of thymol added.

A somewhat similar method, by Dr. Gray (in *The Microscope*), in which he employs one part gold-label gelatine in one hundred parts of warm, distilled water, possesses the same advantages.

The slide is liberally covered with the fixative, the sections placed upon it where they will float; the sections are arranged, slide placed on a water bath and gently warmed. They will gradually expand. The solution is then drained off as much as possible, sections definitely arranged, and the slide allowed to thoroughly dry. When dry, remove the paraffine by turpentine. In staining upon the slide it is preferable to employ alcoholic solutions, as the aqueous solutions will loosen the sections. The disadvantages are the inability to resist water and the time necessary to thoroughly dry (and fix) the sections. As Dr. Piersol remarks, "the results by this simple method so far surpass those obtainable by the extensively used collodion mixtures, and the advantages are so important, that the gum process [and, I would add, the gelatine method of Dr. Gray] well merits a trial." In my opinion it is an excellent method for serial work and for the preservation of the relation of parts.

Dr. Reyburn: The question whether fibrin found after coagulation of the blood has any structural relation to the connective tissues is one on which my belief is that it has no such relation. The amount of fibrin found in the blood increases in conditions of inflammation, thus showing that fibrin is a means of waste, and increases in proportion to the destructive changes going on in the blood.

Dr. James: The time has arrived for adjourning the sessions of the American Society of Microscopists forever. We will now proceed to read the remaining papers before the Society by titles.

Professor William A. Rogers: "The relations between a mikron and a wave length of sodium light."

Dr. William C. Krauss: "The microscope as a factor in the diagnosis, prognosis, and treatment of morbid new growths."

Professor M. D. Ewell: "A new form of graphological microscope."

Professor M. D. Ewell: "Standard glass and speculum metal centimeters."

Dr. Lucien A. Howe: "The mechanical stage as a micrometer."

Dr. Lucien A. Howe: "Floating particles in the eye a source of error in microscopical observation."

Miss V. A. Latham: "The use of stains, especially with reference to their value for differential diagnosis."

E. H. Griffith: "Three new accessories for the microscope."

Professor Henry L. Tolman: "Hints on expert testimony."

Professor John Michels: "The microscopical examination of pork by the U. S. Government."

Dr. Lewis: I move that the American Society of Microscopists be now dissolved.

Seconded and unanimously carried.

Dr. James: The American Society of Microscopists is adjourned *sine die*.

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On Saturday, August 15, at 10 o'clock, those members who remained in the city, together with some members of the Washington Society, enjoyed a very pleasant trip to Mt. Vernon, but no formal meeting was held.



## ***REPORT ON STANDARD CENTIMETERS.***

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Prof. WILLIAM A. ROGERS, Waterville, Me.

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I beg to communicate the following report of an examination of the standard centimeters prepared by Prof. M. D. Ewell and Mr. Charles Fasoldt:

The plate prepared by Mr. Fasoldt a short time before his death is unfortunately not now available as a standard. The ruling was made upon cover-glass, which is protected by another glass.

Portions of the band of lines still show the exquisitely fine character of the rulings of Mr. Fasoldt. In many places they have been seriously injured by the condensation of moisture between the two glasses.

This plate furnishes a conclusive argument against the adoption of this form of mounting for a standard. One cannot but regret that this deterioration has taken place, since it deprives the society of the opportunity of giving deserved recognition to the skill of Mr. Fasoldt.

I have examined the plates prepared by Dr. Ewell with considerable care, although I have been unable to make a study of the errors of the rulings, as the lines are too fine to be seen with the prism illuminator with which my microscope is now furnished.

In order to make this study it would be necessary to adopt some temporary device by which direct illumination could be secured.

The lines on all these plates conform to the requirements to which the writer has repeatedly called attention, in that the grooves should be of such a character that they will not be injured by repeated rubbing in the direction of the lines. It will be found that particles of dust will gather in the grooves, but these can be removed without injury to the lines by rubbing with a soft linen cloth in the manner indicated.

These lines take the powder obtained by scraping the point of a soft lead pencil with the utmost ease and certainty. The lines when thus filled have sharply defined edges, which are admirably adapted to exact measurement. Ordinarily, ruled lines lose their power to take the graphite after a few fillings, but this does not seem to be the case with these specimens. In my judgment, these plates are worthy of an exhaustive study of the errors of graduation.

**REPORT OF THE TREASURER.**

## RECEIPTS.

Aug. 12, 1890. Cash on hand at opening of meeting in Detroit .....		\$178 84
Cash received dues for 1887....	\$2 00	
“ “ “ 1888....	4 00	
“ “ “ 1889....	14 00	
“ “ “ 1890....	30 00	
“ “ “ 1891....	548 00	
“ “ “ 1892....	10 00	
“ admission fees for 1891....	177 00	
		785 00
“ for advertisements in Proceedings	54 00	
“ for sale of Proceedings.....	186 64	
		<u>\$1,204 48</u>

## EXPENSES.

Cash for printing, binding, mailing, engraving, etc., for volume of Proceedings for 1890.....	\$817 48	
Cash for sundry expenses, stamps, freight, stationery, expenses of meetings, etc.....	89 17	
Cash paid Dr. M. D. Ewell for glass plates ..	20 84	
		<u>\$927 49</u>
Cash on hand August 10, 1891, at opening of meeting in Washington.....	276 99	
		<u>\$1,204 48</u>

**REPORT OF SPENCER-TOLLES FUND.**

Balance on hand as per statement August 15, 1890.....	\$253 86	
Received interest to January, 1889.....	\$4 00	
“ “ “ 1890 .....	17 34	
“ “ “ 1891.....	17 68	
		<u>39 02</u>
Total.....		<u>\$292 88</u>

(Signed)

C. C. MELLOR,  
*Treasurer.*

We, the subscribers, hereby certify that we have examined the foregoing account of C. C. Mellor, Treasurer, for the year from August 11, 1890, to August 10, 1891, and have found the same correct, with proper vouchers for the various expenditures.

Signed by—

W. J. LEWIS.  
F. W. KUHNE.WASHINGTON, D. C., *August 13, 1891.*